Nov. 13, 1945. A. A. WEISBERGER ET AL 2,389,109

SPRING WINDING MACHINE

Filed Nov. 20, 1942 4 Sheets-Sheet 1

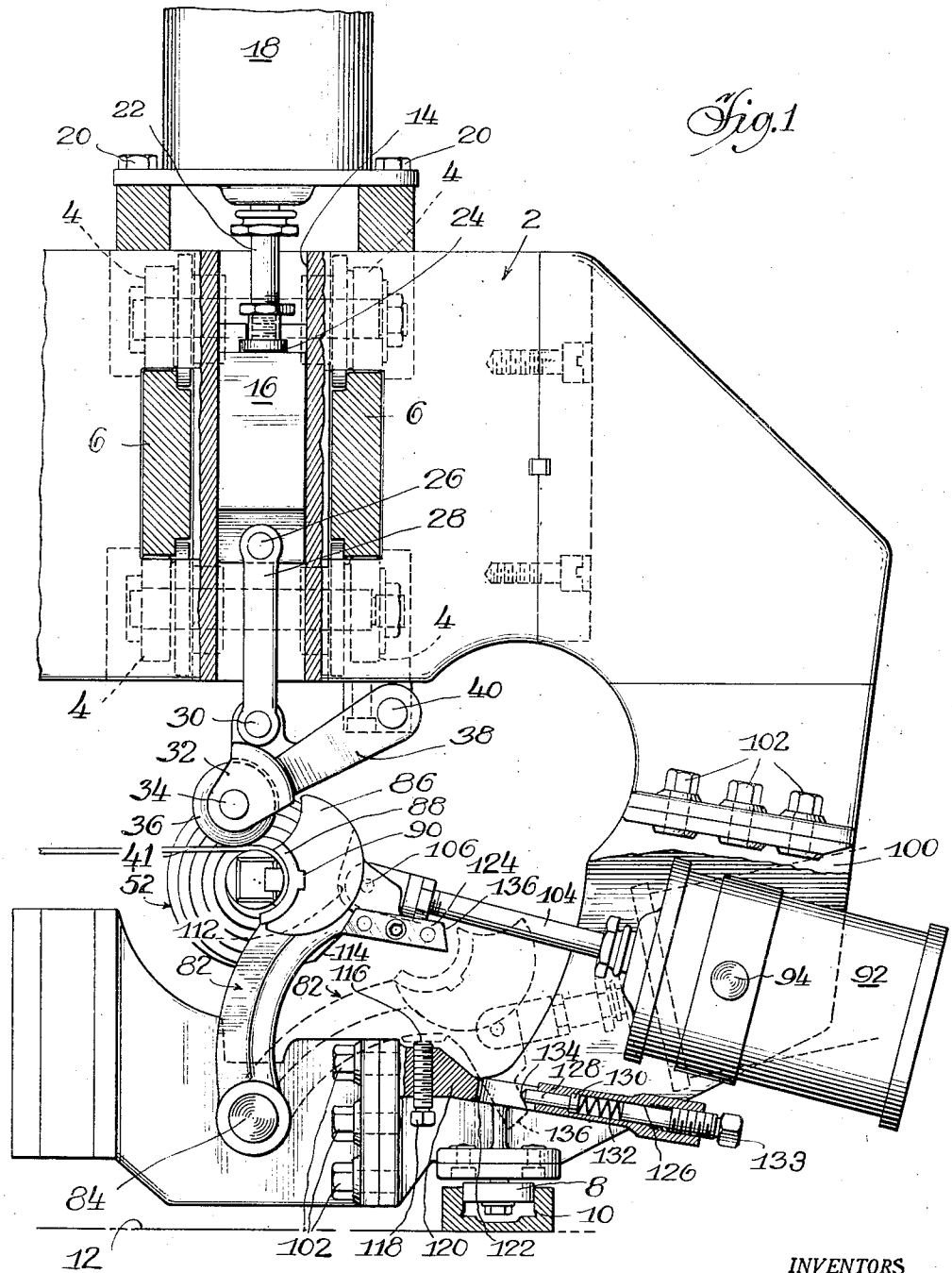


Fig. 1

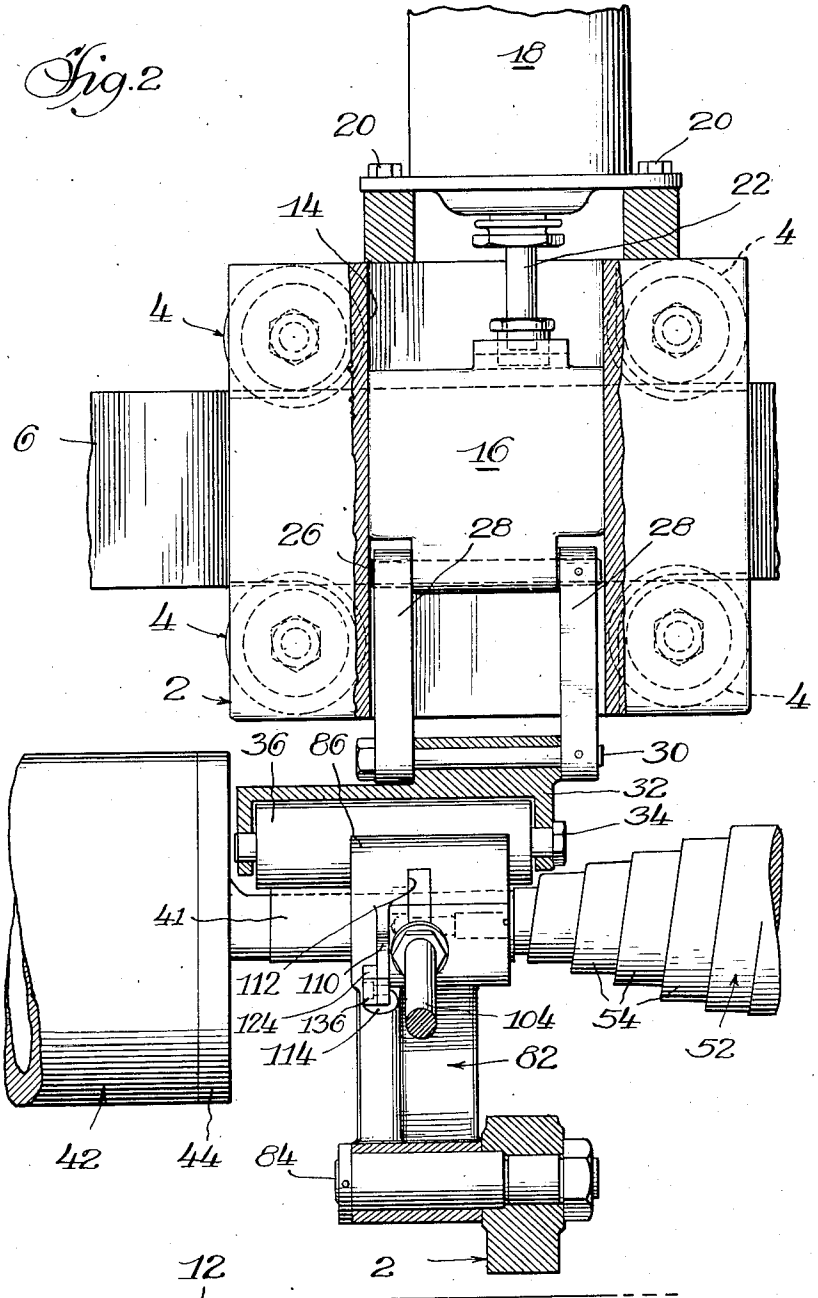
INVENTORS.
Arthur A. Weisberger
and Edward G. Glick
BY Orin O. B. Farmer
Atty.

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SPRING WINDING MACHINE

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Fig. 2



INVENTORS.

Arthur A. Weisberger

and Edward G. Glick

BY Orin O. B. Farmer

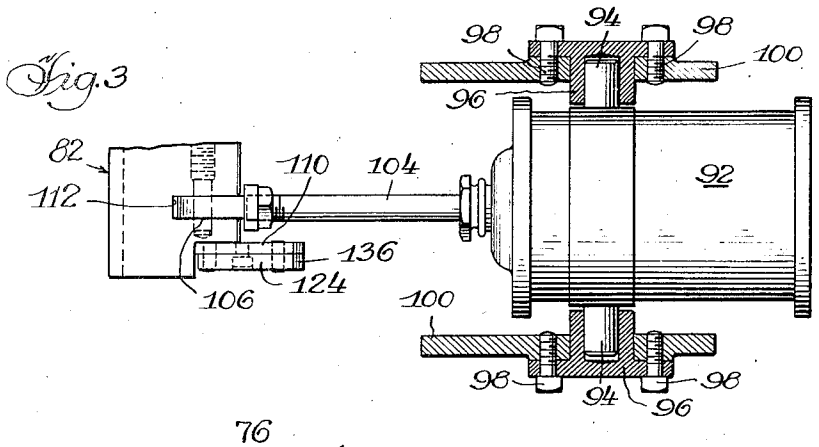
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SPRING WINDING MACHINE

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Fig. 3



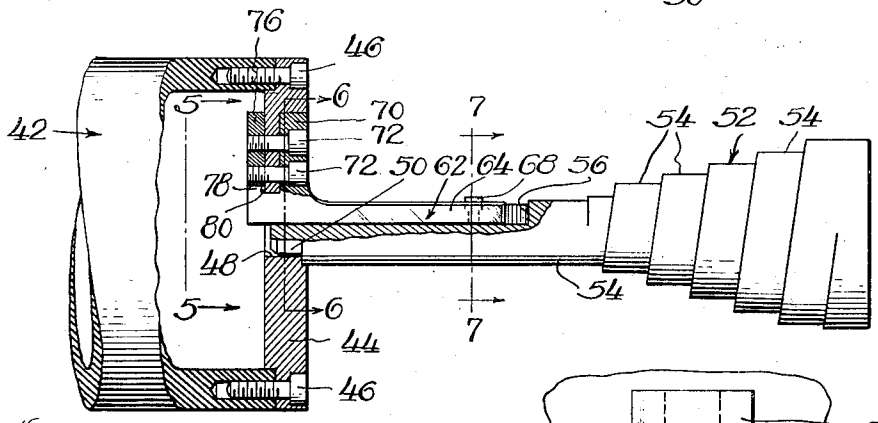


Fig. 4

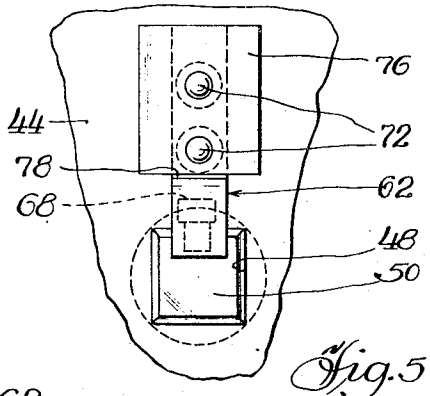


Fig. 5

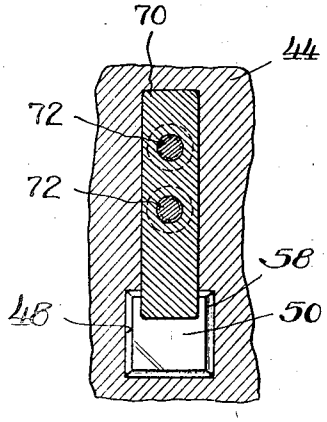


Fig. 6

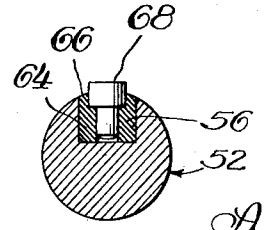


Fig. 7

INVENTORS.
Arthur A. Weisberger,
and Edward G. Glick
BY Orin O. B. Garner
Atty.

Nov. 13, 1945. A. A. WEISBERGER ET AL 2,389,109

SPRING WINDING MACHINE

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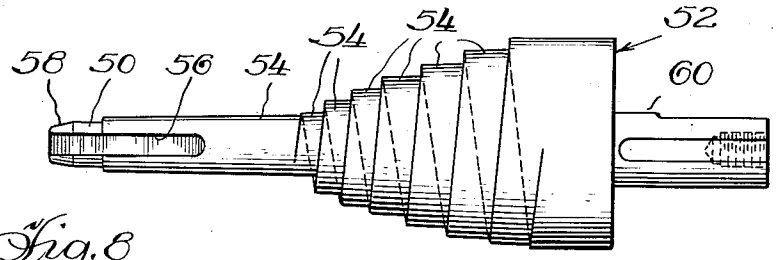


Fig. 8

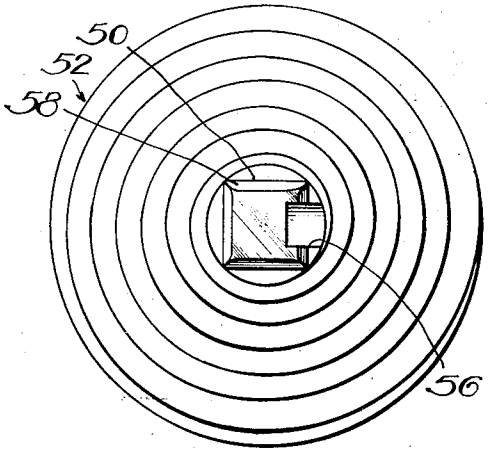


Fig. 9

Fig. 11

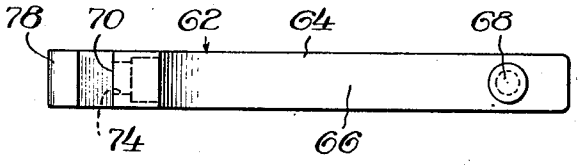
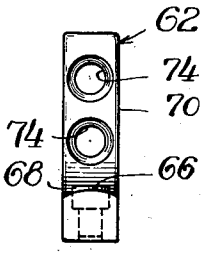


Fig. 12



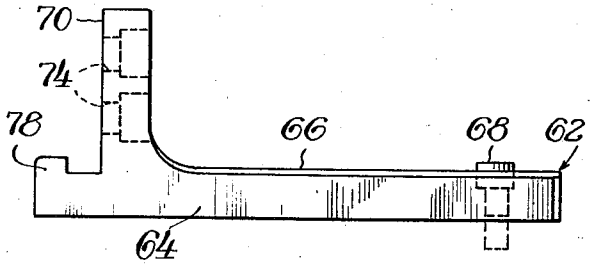


Fig. 10

INVENTORS.
Arthur A. Weisberger
and Edward G. Glick
BY Orin O. Garner Atty.

Patented Nov. 13, 1945

2,389,109

UNITED STATES PATENT OFFICE

2,389,109

SPRING WINDING MACHINE

Arthur A. Weisberger and Edward G. Glick, Hammond, Ind., assignors to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application November 20, 1942, Serial No. 466,268

31 Claims. (Cl. 153—64)

Our invention relates to a device for winding metallic stock into coils and more particularly to a device for winding volute coil springs.

An object of our invention is to provide means for positively stripping the coil from the associated mandrel. Our invention comprehends an arrangement in which a mandrel and a chuck are arranged in driving engagement, the mandrel being retractable from said engagement and the chuck being provided with means in telescopic relationship with the mandrel for stripping therefrom the stock coiled thereon.

A further object of our invention is the provision of means for seating and retaining stock upon the stripping means associated with the chuck as above described.

A specific object of our invention is to design a key member of novel form, said member comprising an elongated body of generally rectangular form provided with an arcuate surface adapted to form with the surface of the mandrel, into which said body is recessed, a continuous cylindrical surface over which the associated stock may be coiled. The body of the key is provided with projecting means adapted to engage the stock and said body is also provided with means formed and arranged for securement to the associated chuck.

Still another object of our invention is to design a novel mandrel adapted for cooperation with the above-mentioned key member, said mandrel being generally cylindrical and being formed as a helix with a plurality of steps of progressively increasing size, the smallest of said steps being provided with a nose portion formed and arranged for driving engagement with an associated chuck and said smallest step also being formed with a slot extending longitudinally of the mandrel and formed and arranged for reception of the key member.

Still another specific object of our invention is the provision of a novel air hammer device for seating and retaining stock upon the key member above described, said hammer being pivotally mounted on an associated carriage and being pivotally connected to the piston rod of an associated cylinder, said cylinder also being pivotally mounted on said carriage.

A further object of our invention is the provision of means for restraining movement of the hammer about its pivotal support until a predetermined pressure is built up within the associated cylinder whereupon said resistance is automatically terminated in order to cause the hammer to strike the associated stock with great force and to seat said stock upon the associated key and mandrel above described. Clearance from the hammer is provided for the associated roller as the hammer and roller are simultaneously engaged with the stock, the axis of the roller being horizontally offset from the axis of the mandrel, and said roller being formed and arranged for rolling the stock upon the mandrel in the usual manner.

In the drawings,

Figure 1 is a view in elevation of our novel device, said view being taken from the chuck engaging end of the mandrel, the chuck and key being removed in order to clarify the view and certain portions of the structure being shown in section in order to further clarify the arrangement.

Figure 2 is a view taken from the right as seen in Figure 1, portions of the structure being shown in section to clarify the view.

Figure 3 is a top view of the air hammer device shown in Figure 1 with the cylinder housing shown in section.

Figure 4 is a somewhat diagrammatic view of our mandrel and key in engagement with the associated chuck, portions of the structure being shown in section for clarity.

Figure 5 is an enlarged fragmentary view taken substantially in the plane indicated by the line 5—5 of Figure 4, and Figures 6 and 7 are enlarged sectional views taken respectively in the planes indicated by the lines 6—6 and 7—7 of Figure 4, the nose of the mandrel in Figure 6 being shown in elevation.

Figures 8 and 9 show in detail our novel form of mandrel, Figure 8 being a side view in elevation taken from the key engaging side thereof, and Figure 9 being an enlarged end view taken from the left as seen in Figure 8.

Figures 10, 11 and 12 are enlarged views showing in detail our novel form of key member, Figure 10 being a side elevation thereof, Figure 11 being a view in elevation taken from the top as seen in Figure 10, and Figure 12 being an end view taken from the right as seen in Figure 10.

Describing our invention in detail, our novel device comprises a carriage generally designated 2 and supported by means of rollers 4, 4 on a pair of beams 6, 6, said carriage being guidably engaged by means of a bearing 8 with a track 10 (Figure 1) on an associated bed designated 12.

The carriage 2 is provided with a substantially vertical rectangular opening 14 formed and arranged for the reception of a block 16 afforded a working fit therein, and a cylinder 18 is mounted

at 20, 20 on the carriage 2, the piston rod 22 projecting from said cylinder 18 being interlocked at 24 (Figure 1) with the block 16 whereby vertical movement thereof may be afforded in the usual manner. The block 16 is pivotally connected at 26 to the upper end of a pair of bars or rods 28, 28, the lower ends thereof being pivotally connected at 30 to a bracket 32 affording a pivotal mounting at 34 for a roller 36, the bracket 32 being provided with an arm 38 (Figure 1) pivotally connected at 40 to the carriage 2 to afford stability for the roller 36 as it is urged by means of the cylinder 18 against the associated bar of spring stock indicated at 41 (Figure 1).

It will be clearly apparent to those skilled in the art that the roller 36 rolls the bar of stock 41 over the associated rotating mandrel, hereinafter more fully described, the carriage 2 being afforded movement parallel to said mandrel by means of the rollers 4, 4. It will be understood that the cylinder 18 is double acting whereby the roller may be engaged and withdrawn from engagement with the associated bar of stock and it will also be understood that any suitable actuating fluid such as oil, compressed air, or steam, but preferably oil, may be utilized in the cylinder. If desired, the roller may be actuated by other means than a cylinder such as, for example, a hand lever, as will be clearly apparent to those skilled in the art.

The chuck designated 42 (Figures 2 and 4) is mounted in the usual manner on a head stock motor (not shown) and said chuck is preferably provided with a removable face plate 44 secured thereto in any convenient manner as by bolts 46, 46 (Figure 4). The face plate is provided with a square opening 48 for the accommodation of a complementary nose 50 on the mandrel generally designated 52 and hereinafter more particularly described.

The mandrel is shown in detail in Figures 4, 8 and 9 and is a generally cylindrical member formed as a helix with a plurality of steps 54, 54 of progressively increasing size, the smallest step 54 being provided with a slot or groove 56 serving a purpose hereinafter described and said step also being provided with the before-mentioned nose 50 for reception within the complementary square opening 48 in the face plate 44, said nose being tapered at 58 in order to facilitate insertion and retraction thereof with respect to the opening 48. On the end thereof remote from the nose 50 the mandrel 52 is preferably formed with a generally cylindrical projection 60 (Figure 8) for engagement with an associated supporting member (not shown), said supporting member being sleeved over the projection 60 and secured to the mandrel in any convenient manner and said member also affording a means for inserting the nose 50 on the mandrel into the opening 48 on the face plate and for retracting said nose therefrom as will be clearly apparent to those skilled in the art.

The key member generally designated 62 is a substantially solid metallic object comprising an elongated body 64 for reception within the slot 56 in the mandrel, the body 64 being afforded an arcuate surface 66 to afford with the surface of the smallest step 54 of the mandrel a substantially continuous cylindrical surface about which the associated bar of spring stock 41 may be coiled, and said key is provided with projecting means preferably in the form of a pin 68 fitted within a complementary opening in the body 64 and comprising a head projecting from the surface 66 for reception within an opening in the bar 41. The key 62 also comprises means for securement to the chuck consisting of a lug 70 conveniently recessed within and secured to the face plate 44 in any suitable manner, as by bolts 72, 72 (Figures 4 and 6) extending through openings 74, 74 conveniently formed in the lug 70 for that purpose, said bolts 72, 72 extending through the face plate 44 and through a backing plate 76 secured to the inner surface of the face plate in any convenient manner as by welding. The key 62 is preferably formed with a relatively small lug 78 adapted to bear against the inner surface of the face plate 44 as at 80 in order to afford a firm engagement therewith as the nose 50 of the mandrel is retracted from the opening 48 in the face plate.

It will be apparent from a consideration of Figure 4 that in the modification shown, the body portion 64 of the key projects into the slot 56 in the mandrel for telescopic engagement therewith as heretofore described, said key being engaged with the chuck as above described whereby, as the mandrel is retracted from engagement with the chuck, the bar 41 is stripped by means of the pin 68 from the mandrel. It will be apparent that the pin 68 may be integrally formed with the key 62 and may, if desired, engage the edge of the bar 41 remote from the chuck instead of an opening in said bar. Moreover, if desired, the key may be made integral with the face plate or may be secured thereto in any desired manner and it will be further apparent that the telescopic engagement between the mandrel and the key may be modified without departing from the scope of this invention, as, for example, by forming the key as a cylindrical projection about the opening 48 with the smallest step 54 of the mandrel being sleeved within the key and engaged with the opening 48. It will be further understood that the opening 48 in the face plate 44 and the complementary nose 50 on the mandrel need not necessarily be square but may, if desired, be of any angular form such as triangular or hexagonal in order to afford a driving engagement between the chuck and the mandrel.

Means for setting and holding the bar 41 on the mandrel 52 and on the pin 68 associated with the key 62 is provided in the form of a hammer device comprising a hammer generally designated 82, said hammer being shown in applied position in Figures 1 and 2 and being indicated in retracted position in dot and dash lines in Figure 1. The hammer 82 is pivotally mounted at 84 on the carriage 2 and comprises a head 86 with a face plate 88 (Figure 1) mounted thereon in tongue and groove engagement therewith as at 90, said face plate being of arcuate contour to conform to the contour of the bar 41, said bar being preformed substantially as shown in Figure 1. It will be readily apparent to those skilled in the art that in the event that a larger coil is desired, thus necessitating a larger mandrel, a face plate 88 having a bar engaging surface of the desired contour may be readily assembled with the head 86 of the hammer and likewise a face plate 88 be readily provided which would accommodate a smaller mandrel than that disclosed in the present modification.

Actuating means for the hammer 82 is provided in the form of a cylinder 92 afforded at opposite sides thereof pivotal mounting by means of the pivot pins 94, 94 associated therewith and journaled in bearings 96, 96 secured in any convenient

manner as by bolts 98, 98 to the cylinder housing 100 secured as by bolts 102, 102 to the carriage 2. A pistol rod 104 projects from the cylinder 92 for pivotal connection at 106 to the hammer head 86, said head being formed with a slot or groove 112 for reception of the end of the rod 104. The hammer is provided with a pad 114 adapted to abut as at 116 (Figure 1) a bolt 118 threaded through a web 120 of the cylinder housing 100 to afford adjustable limitation of the retractive movement of the hammer. It will be understood that the cylinder 92 is double acting to afford movement of the hammer 82 toward and away from the mandrel and said cylinder may be actuated by any convenient actuating fluid, preferably compressed air or other compressible means.

If desired, means may be provided for restraining movement of the hammer toward the mandrel until a predetermined power has been built up in the cylinder 92 whereupon said resistance may be automatically terminated to afford a sharp blow by the hammer against the bar 41. We accomplish this by affording a slot 122 in the web 120 adapted for the reception of a lug 110 on the hammer head 86, said lug being preferably provided with a face plate 124 secured thereto in any convenient manner. A cylindrical passage 126 is formed in the web 120, said passage communicating with the slot 122 through said web and being formed and arranged for the reception of a pin 128, said pin being provided with a head 130 adapted to abut a complementary shoulder in the passage 126 to limit outward movement of said pin with respect thereto. A spring 132 is positioned within the passage 126 and bears against a head 130 of the pin 128, said spring being adjustably compressed by means of a bolt 133 threaded into the outer end of the passage 126. The face plate 124 on the hammer head lug 110 is provided with a cam surface adapted to engage the end of the pin 128 as at 134 (Figure 1) when the hammer is in retracted position as indicated by dot and dash lines in said figure and said face plate is provided with a cam surface 136 adapted for cooperation with the end of the pin 128, whereby said pin may be urged by means of said cam surface 136 inwardly with respect to the passage 126 during retractive movement of the hammer 82 so that the hammer may assume the retracted position indicated in Figure 1.

It will be understood that the pin 128 will maintain the hammer 82 in retracted position until sufficient pressure is built up within the cylinder 92 to overcome the resistance of the spring 132 whereupon the hammer will move toward the mandrel until the face plate 124 on the hammer head disengages the pin 128, thus automatically terminating the resistance of the spring 132 and the pin 128 to movement of the hammer in its advance stroke toward the mandrel. Thus the hammer will strike the bar 41 with great force whereby the same will be set upon the pin 68 of the key 62 and said bar will be firmly seated on the mandrel. In actual practice it has been found that if the cylinder 92 is of sufficient capacity, the above described means for increasing the force of the hammer blow against the bar 41 is not absolutely necessary. However, such means may be extremely useful in the event that a cylinder 92 of less capacity is desirable.

In operation of our novel coil winding device, the bar 41, preformed to substantially the contour indicated in Figure 1, is hooked over the smallest step 54 of the mandrel 52 with an opening through said bar registering with the pin 68 associated with the key 62, whereupon the cylinder 92 is actuated whereby the hammer 82 is urged from the retracted position indicated in dot and dash lines in Figure 1 to the applied position indicated in solid lines in said figure, the face plate 88 mounted on the head 86 of said hammer being urged with great force against the preformed end of the bar 41 whereby said bar is firmly set and held on the mandrel and on the pin 68. Thereafter the roller 36 may by means of the associated actuating mechanism be applied to the bar 41, and the mandrel 52 may be rotated by means of the chuck 42 in the manner heretofore described, the bar 41 being rolled around the mandrel by means of the roller 36, the carriage 2 from which said roller is supported being movably mounted axially of the mandrel for this purpose. The hammer 82 may be maintained in applied position until the bar 41 has been coiled around the smallest step 54 of the mandrel and thereafter said hammer may be retracted by means of the cylinder 92 to the position indicated in Figure 1.

After the bar 41 has been coiled around the mandrel 52 the roller 36 may be withdrawn from engagement therewith by means of the cylinder 18 and the associated mechanism, and thereafter the mandrel 52 may be retracted from engagement with the face plate 44 of the chuck by any convenient means (not shown), whereupon the coiled bar 41 will be positively stripped by means of the pin 68 from the mandrel 52 and will be left hanging on the key 62 from which it may be removed by tongs or any other suitable device.

It may be noted that the axis of the roller 36 is horizontally offset with respect to the axis of the mandrel 52 as may be clearly seen in Figure 1, thus affording clearance from the head 86 of the hammer 82 and also facilitating a tight fit between the bar 41 and the mandrel as the roller rides up the mandrel during the coiling operation as above described.

It is to be understood that we do not wish to be limited by the exact embodiment of the device shown which is merely by way of illustration and not limitation as various and other forms of the device will, of course, be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

We claim:

1. In a volute coil winding machine, a bed, a carriage guidably engaged therewith, means affording a movable support for said carriage, a rotatable chuck, a mandrel engaged therewith, key means on said chuck in telescopic engagement with said mandrel and comprising projecting means, a hammer pivotally mounted in said carriage and adapted to set an associated bar of spring stock on said mandrel and on said projecting means, and roller means on said carriage for coiling said bar on said mandrel, said mandrel being retractable from engagement with said chuck and key means, whereby the coiled bar is positively stripped from said mandrel by said projecting means.

2. In a volute coil winding machine, a bed, a carriage guidably engaged therewith, a rotatable chuck, a mandrel in driving engagement therewith, means affording a movable support for said carriage parallel to said mandrel, key means on said chuck recessed in said mandrel and comprising projecting means, a hammer pivotally mounted on said carriage and adapted to set an associated bar of spring stock on said mandrel and on said projecting means, and roller means on

said carriage for coiling said bar on said mandrel, said mandrel being retractable from engagement with said chuck and key means, whereby the coiled bar is positively stripped from said mandrel by said projecting means.

3. In a coil winder, a chuck, a mandrel in retractable driving engagement therewith, a carriage associated with said mandrel and movable parallel thereto, a hammer pivotally mounted on said carriage, an air cylinder pivotally mounted on said carriage and operatively associated with said hammer, said hammer being formed and arranged to set stock on said mandrel, and roller means mounted on said carriage for rolling said stock on said mandrel, the axis of said roller means being horizontally offset with respect to the axis of said mandrel.

4. In a machine of the class described, a chuck, a key member secured thereto, a mandrel comprising a portion in retractable driving engagement with said chuck, said key member being in telescopic engagement with said mandrel and comprising projecting means for engagement with an associated bar of stock, said projecting means being operative to strip said bar from said mandrel as the same is retracted from engagement with said chuck and said key member.

5. In a machine of the class described, a mandrel, means for rotating said mandrel, stripping means adapted to rotate with said mandrel and adapted for engagement with an associated bar of stock, a hammer pivotally supported adjacent said mandrel for setting said bar on said stripping means, and actuating means associated with said hammer, said actuating means comprising a pivotally mounted cylinder and an operative connection between said cylinder and said hammer.

6. In a machine of the class described, a mandrel, means for rotating said mandrel, stripping means adapted to rotate with said mandrel and adapted for engagement with an associated bar of stock, a hammer pivotally supported adjacent said mandrel for setting said bar on said stripping means, actuating means including a power cylinder associated with said hammer, and means for resisting movement of said hammer toward the mandrel until a predetermined pressure is built up within said cylinder.

7. In a coil winder, a chuck, a mandrel in retractable driving engagement therewith, a carriage associated with said mandrel and movable parallel thereto, a hammer pivotally mounted on said carriage, an air cylinder pivotally mounted on said carriage and operatively associated with said hammer, said hammer being formed and arranged to set stock on said mandrel, and roller means mounted on said carriage for rolling said stock on said mandrel.

8. In a coil winding machine, a rotatable chuck, a mandrel in interlocking engagement therewith, said mandrel being adapted to be retracted from said engagement, key means on said chuck in telescopic engagement with said mandrel, and stripping means projecting from said key means and adapted to be received within an opening in an associated bar of spring stock.

9. In combination, a rotatable chuck member having an angular opening for the reception of a complementary nose on an associated mandrel, and a key member fixed to said chuck member for rotation therewith, said key member having a body portion extending into said opening and adapted for reception within a slot in said nose, and stripping means on said body portion for engagement with an associated bar of stock.

10. In a machine of the class described, a mandrel, means for rotating said mandrel, stripping means adapted to rotate with said mandrel and adapted for engagement with an associated bar of stock, a hammer pivotally supported adjacent said mandrel for setting said bar on said stripping means, and actuating means associated with said hammer.

11. In a machine of the class described, a mandrel, rotating means in driving engagement therewith, stock stripping means fixed to said rotating means and slidably engaged with said mandrel for rotation as a unit therewith, said mandrel being retractable from engagement with said rotating and stripping means.

12. In a machine of the class descibed, a chuck, a key member secured thereto, a mandrel comprising a portion in retractable driving engagement with said chuck, said key being in telescopic engagement with said mandrel and comprising means for engagement with an associated bar of stock.

13. In a machine of the class described, a mandrel, a rotatable chuck in driving engagement with one end thereof, said mandrel being retractable from said engagement, and means fixed to said chuck and associated with said end of said mandrel for positively stripping stock therefrom as said mandrel is retracted from said engagement, said means being immovable with respect to said chuck and being rotatable as a unit therewith.

14. In a coil winder, a mandrel, a recess in the periphery thereof, a chuck in driving engagement with said mandrel, and means fixed to said chuck and receiver within said recess for stripping an associated coil from said mandrel as the same is retracted from engagement with said chuck, said means comprising a member projecting from said recess for engagement with an associated bar of stock.

15. In combination, a rotatable chuck member having an angular opening for the reception of a complementary nose on an associated mandrel, and a key member fixed to said chuck member for rotation therewith, said key member having a body portion extending into said opening and adapted for reception within a slot in said nose, and stripping means on said body portion for engagement with an associated bar of stock, said body portion including an arcuate surface adapted to form with the periphery of said mandrel a continuous cylindrical surface over which said bar of stock may be wound.

16. In a coil winding machine, a chuck, a key thereon, stripping means on said key for an associated bar of spring stock, and a mandrel rotatably and retractably engaged with said chuck and in telescopic engagement with said key.

17. In a coil winder, a chuck, a mandrel in retractable driving engagement therewith, key means on said chuck slidably recessed in said mandrel and comprising stripping means, a hammer for setting an associated bar of stock on said means, actuating means associated with said hammer, and roller means for rolling said stock on said mandrel.

18. In a key for stripping stock from an associated mandrel, a substantially solid member comprising an elongated body for reception within a slot in said mandrel, an arcuate surface on the top of said body for engagement with an associated bar of stock, an upstanding lug on one end of said body and having means for removable securement to an associated chuck, and a pin ex-

tending through said body adjacent the opposite end thereof, said pin projecting from said surface for reception within an opening in said bar of stock.

19. In a key for stripping stock from an associated mandrel, a substantially solid member comprising an elongated body for reception within a slot in said mandrel, an arcuate surface on the top of said body for engagement with an associated bar of stock, an upstanding lug on one end of said body and having means for removable securement to an associated chuck, and means projecting from said surface adjacent the opposite end of said body for stripping said bar from said mandrel.

20. In a machine of the class described, a carriage, a hammer formed and arranged for setting stock upon an associated mandrel, and an air cylinder operatively associated with said hammer, said hammer being pivotally mounted on said carriage for pivotal movement about an axis substantially parallel with the longitudinal axis of said mandrel.

21. In a machine of the class described, a hammer formed and arranged for setting stock upon an associated mandrel, an air cylinder operatively associated with said hammer, and means for resisting movement of said hammer toward said mandrel until a predetermined pressure is built up within said cylinder.

22. In a machine of the class described, a hammer formed and arranged for setting stock upon an associated mandrel, an air cylinder operatively associated with said hammer, and means for resisting movement of said hammer toward said mandrel until a predetermined pressure is built up within said cylinder, said means comprising a spring mounted member and a cam surface on said hammer for engagement with said member.

23. In a coil winder, a chuck, a mandrel in retractable driving engagement therewith, a carriage associated with said mandrel and movable in a direction parallel thereto, a hammer mounted on said carriage, an air cylinder mounted on said carriage and operatively associated with said hammer, said hammer being formed and arranged to set stock on said mandrel, and roller means spaced from said hammer at all times and mounted on said carriage for rolling said stock on said mandrel.

24. In a coil winder, a chuck, a mandrel in retractable driving engagement therewith, a carriage associated with said mandrel and movable in a direction parallel thereto, a hammer pivotally mounted on said carriage, actuating means for said hammer, said hammer being formed and arranged to set stock on said mandrel, and roller means mounted on said carriage for rolling said stock on said mandrel.

25. In a machine of the class described, a mandrel, rotating means in driving engagement therewith, stock stripping means fixed to said rotating means and slidably engaged with said mandrel for rotation as a unit therewith, said stripping means including a member in telescopic relationship with a portion of said mandrel and presenting an arcuate surface for rolling engagement with an associated bar of stock, said mandrel being retractable from engagement with said rotating and stripping means.

26. In a key for stripping stock from an associated mandrel, an elongated body comprising an arcuate surface for rolling engagement with an associated bar of stock, means at one end of said body for removable securement to an associated support element, and means projecting from said surface adjacent the opposite end of said body for interlocking engagement with said bar.

27. In a machine of the class described, a frame, a mandrel, a hammer adapted for setting stock upon said mandrel, said hammer being pivoted to said frame on an axis substantially parallel with the longitudinal axis of said mandrel, and roller means independent of said hammer for rolling stock upon said mandrel.

28. In a machine of the class described, a mandrel, means for rotating said mandrel, a hammer pivotally supported adjacent said mandrel for setting an associated bar of stock on said mandrel, actuating means including a power cylinder associated with said hammer, and means for resisting movement of said hammer toward the mandrel until a predetermined pressure is built up within said cylinder.

29. In a machine of the class described, a mandrel, means for rotating said mandrel, stripping means adapted to rotate with said mandrel and adapted for engagement with an associated bar of stock, a hammer supported adjacent said mandrel for setting said bar on said stripping means, and actuating means including a power cylinder device operatively associated with said hammer.

30. In a machine of the class described, a chuck member, a key secured thereto, a mandrel member comprising a portion in driving engagement with said chuck member, said key being in telescopic relationship with said mandrel member for rotation therewith, and means on said key for engagement with an associated bar of stock, one of said members being retractable from said driving engagement whereby said key is withdrawn from said telescopic relationship with said mandrel member.

31. In a machine of the class described, a hammer formed and arranged for setting stock upon an associated mandrel, a power cylinder operatively associated with said hammer, and means for resisting the advance stroke of said hammer toward said mandrel until a predetermined pressure is built up within said cylinder, said means comprising a spring pressed member, and a plurality of angularly disposed cam surfaces on said hammer for engagement with said member on the advance and retraction strokes respectively of said hammer.

ARTHUR A. WEISBERGER.
EDWARD G. GLICK.